REMARKS:

1) Please accept and enter the present amendment and Response After Final. **Merely editorial and clarifying amendments have been made in the claims, without raising any new issues that would require further search or consideration.** The number of claims has not been changed, and the claims have been clarified to better focus the issues for Appeal if that should become necessary. Therefore, entry of the present Response After Final is appropriate, and is respectfully requested.

2) In the last five lines on the bottom of page 8 of the Final Office Action, the Examiner notes the applicant's prior argument that Hirai et al. does not disclose generating splines directly from the coordinate data of the way points or support points.

The claims have now been amended to more clearly and expressly define the generation of the splines **directly** from the support points or way points. It has also been further clarified that the motion of the milling tool is controlled **based on and in accordance with the splines**.

It is an important feature of the present invention, that there is essentially a single step control whereby the splines are generated directly from the support points, and then the splines are used directly to control the motion of the milling tool along the tool path defined by the splines. In this regard, see the present specification at page 6 line 24 to page 7 line 6, page 7 lines 15 to 17, page 9 lines 4 to 21, and the last paragraph of original claim 1. Particularly, the splines are

generated directly from the support points and are provided to the control arrangement which controls the motion of the milling tool based on and according to the splines (specification page 6 line 24 to page 7 line 6). For example, the splines are defined in a polynomial format so that they can be directly used as a control input of the control arrangement for controlling the milling tool (see claim 19 and page 9 lines 13 to 21).

This is a very simple and efficient method and apparatus making very direct use of the splines, which are generated directly from the data points, and are used directly for controlling the motion of the milling tool.

3) Contrary to the present invention, EP 1,235,126 (Hirai et al.) discloses a more complicated and cumbersome use of splines for controlling a milling tool.

The method and apparatus according to Hirai et al. use NURBS, i.e. non-uniform rational B-splines. It is a characteristic feature of such non-uniform rational B-splines (NURBS) that they define a curve using a rational expression rather than using a polynomial (see par. 0004 of Hirai et al.).

Thus, the method and apparatus of Hirai et al. employ two steps for processing and handling the NURBS. In a first step, the intended tool path is approximated with a succession of rational basis splines (NURBS) as a successive concatenation or sequence of ellipses, circles, hyperbolas, etc. However, such rational basis splines assembled as a sequence of ellipses, circles, hyperbolas, etc. cannot be used directly for controlling the motion of the milling tool. Instead, to carry out the

control, these NURBS are converted into polynomials in a second step, and then the tool path is provided in a form of transformed three-dimensional polynomials in space. Particularly, the control of the milling tool is carried out based on the converted polynomial expressions **derived from** the rational basis splines. (See Hirai et al. paragraphs 0017, 0021, 0023, 0024, 0046, 0060, 0065, 0076, 0083, etc.).

4) Referring to pages 2 to 7 of the Office Action, the rejection of claims 16 to 21 as anticipated by EP 1,235,126 (Hirai et al.) is respectfully traversed.

Present independent claim 16 is directed to a method of milling a surface on a workpiece, whereby the milling involves moving a tool relative to the workpiece along a tool path defined by splines whereby the motion of the tool is controlled based on the splines, and the splines are calculated directly from support points. That is contrary to Hirai et al. as discussed above, in which the rational basis splines (NURBS) are expressly not in a polynomial form and cannot be used directly for controlling the motion of the milling tool. Instead, according to Hirai et al. the basis splines must first be converted into a control signal, for example in polynomial form.

Present independent claim 18 is directed to an apparatus for milling a surface on a workpiece, comprising a control arrangement for controlling a motion of the tool relative to the workpiece along a tool path defined by splines, whereby the control arrangement is adapted to control the motion of the tool along the tool path based on and in accordance with the splines,

rather than first requiring a conversion of the splines into a useful control signal such as a polynomial control signal. Also, the apparatus further comprises means adapted to calculate the splines directly from support points. As explained above, Hirai et al. require a two step process of first forming rational basis splines as a concatenation or sequence of ellipses, circles, hyperbolas etc., and then converting the rational basis splines into multi-dimensional polynomials which can be used to control the motion of the milling tool. The simpler and more-direct application of splines in the present inventive apparatus is not disclosed by Hirai et al.

Present independent claim 20 is directed to a method of milling a surface on a workpiece, comprising steps of generating a plurality of splines directly dependent on and fitting way points, and then moving a miller tool along the workpiece while controlling the moving of the miller tool based on and in accordance with the splines so that the miller tool moves along a tool path defined by the splines. Contrary to such a direct generation of the splines and direct use of the splines to control the miller tool, as discussed above Hirai et al. require a first step of generating rational basis splines as a concatenation of ellipses, circles, hyperboles, etc. and a second step of converting the rational basis splines to multi-dimensional polynomials which are then used to control the motion of the tool. The simpler method according to the present invention is not disclosed by Hirai et al.

Present independent claim 21 is directed to an apparatus for milling a surface on a workpiece, comprising a programming

arrangement that is programmed to define tool path way points, a processing arrangement adapted and programmed to generate a plurality of splines directly dependent on and fitting the way points, and control arrangements that are adapted to control the motion of the miller tool based on and in accordance with the splines so that the miller tool is adapted to move along a tool path defined by the splines. Once again, as discussed above, the apparatus of Hirai et al. is more complicated because of the means required for generating the rational basis splines and then converting the splines into a control signal that can be used for controlling the motion of the tool. The simpler apparatus as presently claimed is not disclosed by Hirai et al.

For the above reasons, the Examiner is respectfully requested to withdraw the rejection of claims 16 to 21 as anticipated by Hirai et al.

5) Favorable reconsideration and allowance of the application, including all claims 16 to 21, are respectfully requested.

Respectfully submitted,
Arndt GLAESSER
Applicant

WFF:he/4932
Enclosures:
Transmittal Cover Sheet

By Walter F. Fasse
Walter F. Fasse
Patent Attorney
Reg. No.: 36132
Tel. 207-862-4671
Fax. 207-862-4681
P. O. Box 726
Hampden, ME 04444-0726

CERTIFICATE OF FAX TRANSMISSION:
I hereby certify that this correspondence with all indicated enclosures is being transmitted by telefax to (571) 273-8300 on the date indicated below, and is addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

Walter F. Fasse 10/12/07
Name: Walter F. Fasse - Date: October 12, 2007